

**In the Specification:**

Please make the following amendments to the **REFERENCE NUMERALS** section beginning on page 7:

10 C-channel

11(A, B) Slides

12 Fastener

13 Inner locking plate

14 Fastener

15 Outer locking plate

16 Support bar

17 Outer locking plate

18 Inner locking plate

19 Fastener

20 Support plate

21 Bracket

22(A, B) Cables

23 Stop

24 Cable fastener

25 U-bolt

- 26 Cable guide
- 27 Nut
- 28 Fastener
- 29 Ball bearing
- 30 Bracket
- 31 Outer arm
- 32 Bearing support
- 33 Inner arm
- 34 Drive screw
- 35 Flange
- 36 Motor
- 37 Limit switch
- 38 Rod
- 39 Lower stop
- 40 Upper stop
- 41 U-shaped bracket
- 42 Fastener
- 43 Coupler
- 45 Nut
- 46(A, B) Pulleys

#### 47 Flange

Please make the following amendments to the **DETAILED DESCRIPTION OF THE INVENTION** section beginning with page 11, line 11:

Referring now to FIG. 3, the support unit 4 is comprised of a planar disposed plate 8 having a flange 9 along both edges parallel to the length of the plate 8. The plate 8 may be composed of a metal and the flanges 9 formed via conventional metal forming techniques. A slide 11A is mounted along the inside and a c-channel 10 mounted along the outside of the flange 9 parallel to the slide 11A. Slide 11A and c-channel 10 are secured to the flange 9 via a plurality of fasteners 12. The slide 11A is attached to the flange 9 so as to allow the slide 11A to function in an extendable and retractable fashion.

Referring now to FIGS. 4-5, a horizontal support 5 is shown attached to the c-channel 10. An exemplary horizontal support 5 is comprised of a support bar 16 having a pair of outer locking plates 15 attached thereto, either mechanically fastened or welded, in a perpendicular arrangement. While the outer locking plate 15 may be rectangular shaped, it is preferred to have the outer locking plate 15 angled with respect to the support plate 16, as shown in FIG. 4. An inner locking plate 13 is placed within the c-channel 10, as shown in FIG. 5. Inner locking plate 13 and outer locking plate 15 are co-located along the length of the c-channel 10 and contact the c-channel 10 in a compressive fashion when fastener 14 is threaded through a hole through the inner locking plate 13. The

described arrangement fixes the horizontal support 5 to the c-channel 10, however, allows adjustment to the location of the horizontal support 5 along the length of the c-channel 10.

Referring now to FIGS. 6-7, an optional horizontal rest 7 is shown attached to one end of a c-channel 10. The horizontal rest 7 is preferred when additional support is required to secure a low-profile display 70 onto the support unit 4. The exemplary horizontal rest 7 shown in FIG. 7 is comprised of a support plate 20 fastened, welded or otherwise fixed to an outer locking plate 17 in a perpendicular arrangement. The support plate 20 may have one or more holes 6 so as to allow mechanical attachment to a low-profile display 70. The support plate 20 should contact the end of the c-channel 10 so as to prevent rotation of the horizontal rest 7 when supporting load from a low-profile display 70, as represented in FIG. 6. The outer locking plate 17 and an inner locking plate 18 are co-located adjacent to the end of the c-channel 10 and contact the c-channel 10 in a compressive fashion when fastener 19 is engaged through a hole through the inner locking plate 17. The described arrangement fixes the horizontal rest 7 to the c-channel 10, however, allows for its adjustment and removal.

Referring now to FIG. 8, the rear of the support unit 4 is shown having a bracket 21 mechanically fastened or welded thereto. The bracket 21 facilitates the fastening of a pair of separately disposed but parallel cables 22(A, B) to the support unit 4 via cable fasteners 24. The dual cable 22A arrangement allows for extension and retraction of the support unit 4 via extension and retraction of the intermediate unit 3. While bracket 21 location is design dependent, the extended height of the support unit 4 above the intermediate unit 3 is directly related to the distance between

bracket 21 and top of support unit 4.

Cables 22(A, B) ~~[[is]]~~ are typically ~~[[an]]~~ elements having a small cross section, yet sufficiently flexible to allow for small radius bends and sufficiently strong to support the weight of a low-profile display 70. For example, it was preferred to have a cable 22A composed of a bundled arrangement of thin wires. In yet other embodiments, the cable 22A was composed of a flexible metal chain.

Referring now to FIG. 9, an exemplary attachment scheme for cable 22B to plate 8 comprising the support unit 4 is shown in detail. While various hardware schemes are possible, adequate interlock between cable 22B and bracket 21 was achieved by securing the cable 22B between a cable guide 26 having a channel conforming to the shape of the cable 22B and a u-bolt 25. The u-bolt 25 was fastened to bracket 21 and cable guide 26 through a pair of holes separate disposed about the cable 22B passing through each component. A nut 27 was threaded onto the both ends of the u-bolt 25 thereby providing the compression required to secure cable 22B to cable fastener 24 and thereafter to bracket 21. Identical attachment schemes are used for cable 22A.

Referring now to FIG. 10, the present invention is shown with intermediate unit 3 extended from base unit 2 and support unit 4 extended from intermediate unit 3. Extension and retraction between intermediate unit 3 and support unit 4 and between base unit 2 and intermediate unit 3 is achieved via a pair-wise arrangement of linear slides 11A and 11B, respectively. Each slide 11(A, B) is comprised of an outer arm 31 and an inner arm 33. An inner arm 33 is fastened via a plurality of fasteners 28 to the inside of each flange 62 along the base unit 2 as shown in FIG. 10 and to the

inside of each flange 9 along the support unit 4 as shown in FIG. 3. Outer arms 31 are fastened to intermediate unit 3 as represented in FIG. 10. Slides 11B and 11A separate base unit 2 from intermediate unit 3 and intermediate unit 3 from support unit 4, respectively, in an offset fashion so as to prevent interference contact during extension and retraction.

A variety of linearly extensible slides 11(A, B) are applicable to the present invention. For example, [[a]] slides 11(A, B) may be comprised of two movable linear-shaped and interlocking elements having a low-friction polymer there between. However, preferred embodiments consisted of [[a]] bearing-based slides 11(A, B), as described in FIGS. 11-12. FIG. 11 shows one such slide 11(A, B) having an outer arm 31, an inner arm 33 with bracket 30 fastened or welded thereon, and a bearing support 32 with a plurality of pair-wise arranged ball bearings 29.

Referring now to FIG. 12, the outer arm 31 is a u-shaped channel of linear extent. A bearing support 32, also of linear extent, is attached in a fixed fashion to the inside of the outer arm 31 and between outer arm 31 and inner arm 33 so as to secure a plurality of ball bearings 29 along the length of the slide 11(A, B). While it is preferred to have both inner arm 33 and outer arm 31 composed of a metal, the bearing support 32 should be composed of a low-friction polymer, including but not limited to polytetrafluorethylene and polyethylene. Ball bearings 29 were positioned along the bearing support 32 in holes of like-size dimension so as to allow for their rotation within the holes when inner arm 33 traverses the length of the outer arm 31. A plurality of holes 6 were provided along the length of the outer arm 31 to facilitate attachment with flange 9 along the support unit 4 and with flange 62 along the base unit 2 via fasteners 28, as shown in FIG. 10. A plurality of holes

6 are also provided along the length of the bracket 30 so as to facilitate attachment between slides 11(A, B) and intermediate unit 3 via fasteners 28 along the planar surface of the intermediate unit 3, also shown in FIG. 10.

Referring now to FIG. 13, the front of the base unit 2 is shown having a motor 36 at one end and a drive screw 34 along its length. Also shown is a slide 11B fastened to the inside of each of two flanges 62 disposed along the length of the base unit 2 and perpendicular to the plate 58. A flange 35 is located adjacent to the lower end. A fourth flange 53 is located along the upper end adjacent to the intermediate unit 3 attached to and perpendicular to the plate 58, as represented in FIG. 16. Flanges 62 are either welded, mechanically fastened or fabricated using metal shaping techniques. Likewise shown is a pair of cables 22A and 22B traversing the length of the base unit 2 and parallel about the drive screw 34.

The motor 36 is attached via several fasteners 42 to the flange 35 at the lower end of the base unit 2, as shown in FIG 14. While various motor 36 types are applicable to the present invention, preferred embodiments were reversible and DC powered. One specific example being a 24V motor, model number 403.979 manufactured by Valeo Auto-Electric Wischer und Motoren GmbH (Motors and Actuators Division) with an office at Stuttgarter Strasse 119 D-74321 Bietigheim, Germany.

The motor 36 is directly coupled to the drive screw 34 via a coupler 43 thereby locking the rotational shaft of the motor 36 to the drive screw 34. The coupler 43 is a metal cylinder having a cavity conforming to the end of both motor shaft and drive screw 34. A u-shaped bracket 41 is positioned above the motor 36, adjacent to the coupler 43, and welded to both plate 58 and flange

35. The u-shaped bracket 41 has a hole of slightly larger size than the drive screw 34 so as to allow its rotation yet provide lateral support to the drive screw 34.

Referring again to FIG. 13, an optional rod 38 is provided parallel to the drive screw 34 along the length of the base unit 2. The rod 38 passes through a hole in an unobstructed manner along the flange 35 at the lower end of the base unit 2 and the flange 50 at the lower end of the intermediate unit 3. A lower stop 39 is secured to the rod 38 via a set screw above the flange 35 attached to the base unit 2. A spring 61 is positioned along the length of the rod 38 between lower stop 39 and flange 35 and depressed by a stop 23 when compound lift 1 is retracted, as shown in FIG. 14. An upper stop 40 is likewise secured to the rod 38 via a set screw above the flange 50 along the intermediate unit 3. Stop 23, lower stop 39 and upper stop 40 are cylinder shaped elements disposed about the rod 38. The limit switch 37 is fastened to the flange 35 via at least one nut 45, also shown in FIG. 14. The rod 38 is mechanically attached to the optional limit switch 37 below the flange 35, as shown in FIGS. 13-14.

While limit switches 37 are understood within the art, preferred embodiments of the present invention included a mechanically activated two position electrical device. The limit switch 37 is electrically connected to the motor 36 through a controller 106 or directly via a wire 66 shown in FIG.1.

Interaction between flange 50 and lower stop 39 or upper stop 40 communicates the location of the intermediate unit 3 along its travel length to the limit switch 37. For example, contact between lower stop 39 and flange 50 during retraction moves the rod 38 in a downward direction so as to



mechanically trip the limit switch 37 thereby terminating power to the motor 36 and reversing the rotation of motor 36 and drive screw 34 attached thereto. Likewise, contact between upper stop 40 and flange 50 during extension moves the rod 38 in an upward direction so as to mechanically trip the limit switch 37 thereby terminating power to motor 36 and again reversing the rotation of motor 36 and drive screw 34.

Flanges 47, 50 are located at either end of the planar dispose plate 52 comprising the intermediate unit 3 and may be located to the same side or opposite sides of the plate 52. Plate 52 may be composed of a metal and the flanges 47, 50 formed via conventional metal forming techniques. Referring now to FIG. 15, a stiffener 51, typically a hollow beam or u-shaped element, is mechanically fastened to the plate 52 in a lengthwise fashion so as to resist deflection of the intermediate unit 3 during extension and retraction.

Referring again to FIG. 15, the drive screw 34 is shown passing through a first bushing 48 mechanically secured to the flange 50 via a pair of fasteners 49. Flange 50 also supports a pair of pulleys 46B oriented in a downward fashion, also mechanically fastened thereto. The upper end of the intermediate unit 3 has a pair of pulleys 46A oriented in an upward direction attached to a flange 47 of identical design and arrangement as in flange 50, as shown in FIG. 17. Pulleys 46(A, B) are angled in an inward direction to minimize their protrusion beyond the flanges 47, 50, yet allowing sufficient distance between cables 22(A, B) and flanges 47, 50 to avoid their contact. Pulleys 46(A, B) and their fastening are understood in the art.

Referring now to FIG. 16, the end of the drive screw 34 is mechanically secured to the flange

53 at the upper end of the base unit 2 via a second bushing 54. It is preferred that the drive screw 34 not have threads along its length contacting the second bushing 54. The second bushing 54 is composed of a low-friction material, preferably a polymer, allowing the drive screw 34 to freely rotate in a secured fashion. The second bushing 54 is held in place via an interference fit between second bushing 54 and hole through flange 53.

Referring again to FIG. 16, rotation of the drive screw 34 is communicated to the intermediate unit 3 via the first bushing 48. First bushing 48 is secured to the flange 50 at the bottom of the intermediate unit 3 between a pair of pulleys 46B. A flat 57 is located along one edge of the first bushing 48 so as to contact the plate 52 and prevent rotation of the first bushing 48 when drive screw 34 rotates. Unlike the second bushing 54 described above, the first bushing 48 is preferred to be composed of a low-friction metal, one example being brass, having a thread pattern of likewise design to engage the thread pattern along the drive screw 34. Rotation of the drive screw 34 is transferred to the first bushing 48 so as to move the intermediate unit 3 attached thereto in a linear fashion along the length of the drive screw 34.

While movement of the intermediate unit 3 is via the drive screw 34, movement of the support unit 4 is via cables 22(A, B). Referring now to FIG. 18 shows a schematic diagram describing the arrangement of a cable 22A about one side of the drive screw 34. One end of the cable 22A is fastened to the flange 35 at the lower end of the base unit 2 and vertically aligned upward so to contact a pulley 46A fastened to the flange 47 at the upper end of the intermediate unit 3. Thereafter, the cable 22A is vertically aligned downward so to contact a pulley 46B fastened to the

flange 50 at the lower end of the intermediate unit 3. The path of the cable 22A effectively encircles the intermediate unit 3 and contact is effected via a pair of pulleys 46(A, B) along one side of the drive screw 34, as graphically represented in FIG. 18. Thereafter, the end of the cable 22A is fastened to a second flange 53 at the upper end of the base unit 2. The cable 22A is fixed to the rear of the support unit 4 via a cable fastener 24, as described above. The described arrangement is required along both sides of the drive screw 34 to effect coupled movement between intermediate unit 3 and support unit 4.

Referring now to FIG. 19, the first cable end 63 is terminated by a t-shaped connector 59 crimped, mechanically fastened or welded to the cable 22A. The t-shaped connector 59 either resides within a hole or slot along the flange 35 at the lower end of the base unit 2 thereby securing it to the compound lift 1, as shown in FIG. 14.

Referring now to FIG. 20, the second cable end 64 is terminated by a threaded connector 55 also crimped, mechanically fastened or welded to the cable 22A. The threaded connector 55 partially traverses a hole within the flange 53 at the upper end of the base unit 2. A nut 60 is threaded onto the threaded connector 55 and tighten so as to remove slack along the length of the cable 22A.